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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,449	03/20/2002	Takayuki Nagayasu	220353US2PCT	7561

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EXAMINER	
MEEK, JACOB M	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/070,449	NAGAYASU, TAKAYUKI	
	Examiner	Art Unit	
	Jacob Meek	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2* is/are allowed.

6)☒ Claim(s) *1,3 and 4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/20/05 have been fully considered but they are not persuasive.

With regard to claim 1 and applicant's argument regarding soft decision equalizers. Examiner agrees that there is one soft decision block shown in Chiasson's disclosure. Examiner further notes that Chiasson specifies that soft decisions are generated for each branch (see column 4, lines 38 – 40). Because of Chiasson's stipulation that soft decisions are generated for each branch, it is interpreted that this provides equivalent functionality even though not shown explicitly. The key point being that soft decisions are output on a per branch basis which is interpreted as providing individual calculations of results.

With regard to claim 1 and applicant's argument regarding summing of outputs of soft decision equalizers. Chiasson stipulates the combining of equalized diversity signals (see column 6, lines 51 – 59) which is interpreted as equivalent to summing in that multiple values are used to produce a single result.

With regard to claim 3 and estimation of noise power. Liu discloses a technique for the estimation of noise power (see column 9, line 65 – column 10, line 16).

With regard to claim 3 and division of results with noise power. Liu discloses the use of noise estimates as a weighting coefficient (see column 8, lines 11 – 24). Weighting is a method of scaling a result, of which division is a known means of scaling a result.

With regard to claim 4 and soft decisions with common reliability information. Okanoue discloses the use of branch metric calculation circuits (see figure 3, 66, 67, 68, 69 and column 5, line 60 – column 6, line 20 where these are interpreted as soft decision units). Okanoue discloses a feedback loop from the Viterbi decoder (figure 3, 72,) via the

synchronization establishing circuit (see figure 3, 73) for control of channel estimation utilizing decision signal from Viterbi decoder (see column 6, lines 21 – 38 where this is an error correcting unit). It is believed that this feedback loop, while not identical to applicant's disclosure does meet the limitations of the claims language.

2. Restatement of previous art rejections.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Chiasson et al (US-5,546,429).

With regard to claim 1, Chiasson discloses a radio communication receiver comprising: analog signal generating units in number P (see figure 1, 150, 152 and column 3, lines 61 – 63), A/D converters in number P each of which converts the analog signal of the corresponding analog signal generating unit into digital signals (see figure 1, 158, 160 and column 4, lines 5 – 9); and a demodulator which demodulates the digital signal output by the corresponding A/D converter based on a desired method (see figure 1, 166, 168 and column 4, lines 22 – 31), the demodulator having soft-decision output equalizers in number P each of which makes a soft decision on the digital signal output by the A/D converter (see figure 1, 174 and column 4, lines 38 – 40 where this functionality is interpreted as equivalent); a combining unit which combines the results of the soft decisions by the soft decision output equalizers and outputs the result as a soft decision value (see figure 1, 184, and column 4, lines 38 – 48); and an error correction unit which performs error correction processing with respect to the soft-decision value output by the combining unit (see figure 1, 202 and column 7, lines 8 – 18).

Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by Liu (US-6,137,824).

With regard to claim 3, Liu discloses a radio communication receiver comprising: analog signal generating units in number P (see figure 4, 303 and column 8, lines 39 – 49), A/D converters in number P each of which converts the analog signal of the corresponding analog signal generating unit into

digital signals (see figure 4, 303 and column 8, lines 39 – 49); and a demodulator which demodulates the digital signal output by the corresponding A/D converter based on a desired method (see figure 4, 303 and column 8, lines 39 – 49), the demodulator, having soft-decision output equalizers in number P each of which makes a soft decision on the digital signal output by the A/D converter (see figure 4, 303 and column 8, lines 53 – 56 where this functionality is interpreted as equivalent); noise power estimating units in number P each of which estimates noise power of digital signal output by corresponding A/D converter (see figure 4, 304, 400, 307and column 9, lines 40 – 51); a combining unit which divides the results of the soft decisions by corresponding noise power, combines the results of the division to output a soft decision value (see figure 4, 308, and column 9, lines 51 - 54); and an error correction unit which performs error correction processing with respect to the soft-decision value output by the combining unit (see figure 4, 308, and column 8, lines 49 – 52).

Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Okanoue et al (US-5,701,333).

With regard to claim 4, Okanoue discloses a radio communication receiver comprising: analog signal generating units in number P, A/D converters in number P each of which converts the analog signal of the corresponding analog signal generating unit into digital signals (see figure 3, 56, 57 and column 3, lines 30 – 37); and a demodulator which demodulates the digital signal output by the corresponding A/D converter based on a desired method (see figure 3, 58, 66 and column 4, lines 22 – 31), the demodulator having soft-decision output equalizers in number P each of which makes a soft decision on the digital signal output by the A/D converter (see figure 3, 61 and column 6, lines 27 – 31 where this functionality is interpreted as equivalent) based on common reliability information that is fed back from error detector (see figure 3, 73 and column 6, lines 31 – 38); a combining unit which combines the results of the soft decisions by the soft decision output equalizers and outputs the result as a soft decision value (see figure 3, 71, and column 6, lines 21 – 26); and an error correction unit which performs error correction processing with respect to the soft-decision value output by the

combining unit (see figure 3, 72 and column 6, lines 26 – 38) generates reliability information of decoded bits, and feeds back reliability to the soft decision equalizers (see column 6, lines 31 – 38).

Allowable Subject Matter

3. Claim 2 is allowed.

4. The following is a statement of reasons for the indication of allowable subject matter: The combination of elements and functions supporting the level adjustment in conjunction with operation of soft decision device does not appear to be anticipated or rendered obvious by prior art.

Other Cited Prior Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okanoue (US-5,127,025, previously cited) discloses a diversity receiver with many aspects of applicant's claimed invention.

Meidan (US-5,193,102, previously cited) discloses a diversity receiver utilizing C/I ratios for the adjustment of equalization.

Rasky (US-5,265,122, previously cited) discloses a diversity receiver with a feedback path for control of paths prior to combining.

Jones (US-6,654,340, previously cited) discloses a diversity receiver with many aspects of applicant's claimed invention.

Nokes (US-6,792,258) discloses a diversity receiver with a feedback path for control of paths prior to combining.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM
2/28/06 JMM

JAY K. PATEL
SUPERVISORY PATENT EXAMINER